

Transportation Case Study

Louisville-Southern Indiana Ohio River Bridges Project Environmental Impact Statement – Jefferson County, KY and Clark County, IN April 2003

A. Background Summary:

From 1990 to 2025, based on existing trends, the population in the Greater Louisville, KY area is predicted to rapidly increase by 31%, with a 53% increase in employment (although the residential population within the downtown Louisville area is decreasing). Area-wide, the vehicle miles traveled (VMT) is increasing by 57%; on the existing bridges crossing the Ohio River VMT is increasing by 150%. Area-wide the vehicle hours traveled (VHT) is increasing by 74% while the cross-river traffic (VHT) is increasing by 145%. Employment in the downtown Louisville area is predicted to increase because of downtown redevelopment projects such as the new medical center, the Bluegrass Industrial Park on I-64, and the new Technology Park (formerly the Naval Ordnance facility). In Indiana, the redevelopment of the Clark Maritime Center Riverport and the Indiana Army Ammunition Plant (IAAP) will create thousands of new jobs. Residential development in existing open areas in eastern Indiana and Kentucky is also increasing rapidly.

B. Needs for Action:

1. Currently, the existing bridges across the Ohio River are congested and under-designed for the required capacity now and in 2025:

- Kennedy Bridge: is a narrow bridge with 4 northbound lanes and 3 southbound lanes (82-126 feet wide) with reduced shoulder widths (to accommodate the additional of the fourth lane in 1996). The Kennedy Bridge is overcapacity now, as mixed truck car traffic is funneled north-south across the river at this point from I-65, I-64, and I-71. This bridge is located adjacent to downtown Louisville in Kentucky and downtown Jefferson and Clarksville in Indiana.
- George Rogers Clark Memorial Bridge: Highway 31 crosses the river just downstream of the Kennedy Bridge on this 2-lane narrow bridge (38-70 feet wide) with no shoulders and narrow sidewalks. This bridge is located adjacent to downtown Louisville in Kentucky and downtown Jefferson and Clarksville in Indiana. This bridge will be over capacity by 2025.
- Sherman Minton Bridge: I-64 crosses the river downstream of downtown Louisville on this narrow (42 feet wide) 3-lane bridge with no shoulders. This bridge is located adjacent to downtown New Albany, Indiana and a densely populated area of western Louisville. This bridge will be overcapacity by 2025.

No other bridges cross the river upstream within 40 miles of the Kennedy Bridge to serve the existing and future traffic originating from the rapid residential and commercial development in eastern Indiana and Kentucky. The closest bridge downstream is 30 miles away.

High traffic volumes and high densities of mixed large trucks and cars create congestion and delays, as well as accidents. All three existing bridges in the Louisville area are too narrow to provide traffic flow around accident and maintenance sites, substantially increasing congestion and blocking emergency response vehicles to accident sites.

2. I-264 and I-265 are two circumferential freeway systems around the densely populated areas in Indiana and Kentucky. I-264, the “inner beltway” around Louisville connects to I-64 at the Sherman Minton Bridge to cross the river; its eastern terminus does not cross the Ohio River, and I-264 does not exist on the Indiana side. I-265, the “outer beltway,” does not connect Indiana and Kentucky across the Ohio River on the eastern side.

Summary: The lack of bridges with sufficient capacity and design in the Louisville area; lack of additional crossings of the Ohio River, particularly upstream of the Louisville area to support existing traffic and the substantially increased future traffic from the new residential and commercial developments to the east; and the lack of cross-river connections of both I-264 and I-265 in the eastern portion of the area in Kentucky and Indiana, again in the area of increased residential and commercial development, creates congestion on the existing bridges and substantially increased drive time for people in the eastern portion of the area for getting across the river.

3. The Kennedy Interchange, downtown Louisville: I-64, I-65 and I-71 all converge at the foot of the Kennedy Bridge. All three interstate highways collect traffic from concentrated commercial areas, historic and residential districts, and active industrial areas. This interchange, dubbed “Spaghetti Alley,” has a confusing and unsafe design, with many left-turn exit ramps, weaving caused by entrance and exit ramps that are too close together; poor sight distances, and entrance and exit ramps that have turning radii that are too tight. High traffic volumes interacting with the complex design can result in backups on one lane spilling over and causing congestion throughout the interchange and on its interstate approaches. Backups from the Sherman Minton and Clark Bridges can also block access and cause backups at the Kennedy Interchange.

Because of these design problems and high traffic volumes, the Kennedy Interchange and the Kennedy Bridge have a history of high crash rates (172% higher than the average crash rates in Kentucky and 98% higher than the average in Indiana).

C. Measures of Effectiveness:

- Vehicle Hours of Travel (VHT)
- Vehicle Miles of Travel (VMT)
- Vehicle Hours of Delay (VHD)
- Bridge Demand as percent of Capacity
- Bridge Level of Service (LOS)
- Kennedy Interchange Peak Hour Speed
- Kennedy Interchange Peak Hour Throughput
- Kennedy Interchange Link Density
- Conformity with Roadway Design Standards
- Completion of Eastern Cross-River Transportation System

D. Scope of Decisions to be Made and Alternatives

The problems associated with all three bridges in terms of congestion (capacity) and underdesign (narrow) are related to each other because the same highways access the area and congestion and/or accidents on one bridge can cause congestion on the other bridges as traffic attempts to cross the river (the closest bridges beyond these three are 30-40 miles away). The design and capacity issues associated with the Kennedy Interchange, although sufficiently problematic independently of the bridge problems, are related to the problems with the three bridges because the interchange feeds high volumes of mixed truck/car traffic from three interstate highways onto the Kennedy Bridge, substantially contributing to both congestion and safety problems on the Kennedy Bridge and, with overflow, to the other two bridges. Connecting I-264 and I-265 across the Ohio River between Indiana and Kentucky in the eastern part of the area would provide relief of the heavy traffic on the Kennedy Bridge and Interchange, would support the substantial residential and commercial development already planned and initiated in the eastern portion of the area, and would connect the beltways between Kentucky and Indiana.

Therefore, since all three problems are inter-related in terms of need for action and the potential solutions, considering all three at the same in the same document, although daunting, is an appropriate scope.

In response to this scope, the array of alternatives considered three sets of options:

- 1) three ways to cross the river related to the Kennedy and Clark Memorial Bridges (downtown alternatives)
- 2) six ways to cross the river connecting I-264 and I-265 in the eastern part of the study area (including five alternatives upstream of Six Mile Island and one alternative downriver of Six Mile Island) (east end alternatives)
- 3) Various ways to address the design and congestion problems with the Kennedy Interchange, which also had to interact successfully with the downtown alternatives.

These options were combined into a number of alternatives that met the objectives and addressed environmental concerns differently.

E. Analysis Process for the Case Study

The EIS analyzed many issues in a relatively cursory manner, while focusing primarily on impacts to the many historic properties and districts in the area. In addition to the EIS, a lengthy technical report providing background information for cumulative impacts analyses, including minutes of the many meetings that were held to obtain information on potential cumulative actions and affected environment-type information on some of the resources that might be cumulatively impacted, was prepared.

For the case study, I reviewed the information in both documents, and selected four resources that would provide different and, sometimes, inter-related, analyses for direct, indirect, and cumulative impacts. In that way, I could focus the attention of the participants on the types of issues that would typically be of concern in transportation-type projects while helping them learn the types of questions that need to be asked in identifying and developing cumulative impact cause-and-effect relationship and how to adapt that process to different types of analyses. I also wanted to show how issues that

are often evaluated independently of each other (water quality and Indiana bats, for example) might actually be interrelated and how the interdisciplinary approach to developing cause-and-effect relationships can actually bring those interrelationships to light. All the pages pertinent to the four resources from both documents (including from the Environmental Consequences chapter, except for historic buildings/districts) were incorporated into the case study packet. To help the participants and to save time, I identified the page numbers of the packet that applied to each resource, as well as provided each team with colored maps of the alternatives, location of other actions in the area that might contribute as cumulative actions, the detailed transportation maps, and maps pertinent to the specific resources, all taken from the two documents. Each team was to read the information pertinent to their resource and, using the information and the maps, develop a presentation of the appropriate cause-and-effect relationship(s) for their resource, identify missing information needed to complete the cause-and-effect relationship, and lead a discussion on the questions and challenges they encountered in identifying geographic and temporal scopes and whether their cause-and-effect relationship(s) represented direct, indirect, or cumulative impacts.

F. Analysis of Issues

The four resources selected and presented (in this order) were:

1. Impacts to water quality
2. Impacts to threatened and endangered species
3. Impacts to wetlands
4. Impacts to historic structures/districts

I selected the order of presentation so as to have each presentations build on each other, to reveal any interrelationships, and to show how the same process can be adapted to different types of analyses appropriate for a particular resource.

1. Impacts to water quality

This team found that pertinent information for five different streams and rivers was scattered throughout the two documents incorporated into the case study packet, and that information related to sources of contamination, types of contamination, and capacity of each stream to deal with the levels of contamination had to be integrated from these various sources to understand the current condition and how that condition might change with both the proposed alternatives and the other, unrelated cumulative actions.

The five streams included (in addition to the Ohio River itself), west to east: Lacassange Creek and Lentzier Creek in Indiana, and Beargrass Creek, Goose Creek, and Harrods Creek in Kentucky.

Information on the water quality of the Ohio River included chlordane contamination and prohibitions on fish consumption and swimming. However, no sources of these contaminants were identified, so no cause-and-effect relationship could be developed. However, the team was able to identify potential contributions of more contaminants with more fill and sediment from improvements to the existing locks and dams, and the potential for construction in the floodplain actually restricting the floodplain and causing more floods in smaller streams flowing into the Ohio River; and construction releasing

more contaminants in the form of fertilizers, at a minimum. However, there was no ability to determine what the potential problems with impacts to some resource(s) might be with the present and potential future contaminants from industry, development, and the proposed alternatives (cumulative impacts).

In Kentucky, Beargrass Creek was the furthest west and therefore flowed through highly developed areas in downtown Louisville just to the east and south of Kennedy Interchange. Not surprisingly, it had problems with high biological oxygen demand (BOD) from failed septic tanks and lawn chemicals, as well as heavy metals from industry. It also had problems with impaired channel flow, especially from sediment. The specific industries contributing to the heavy metal component were not identified. The downtown alternatives have the potential to contribute more chemicals to an already highly impaired stream, both from construction and traffic, although traffic contribution is already probably extremely high. However, again, there was no ability to determine what the potential problems with impacts to some resource(s) might be with the present and potential future contaminants (cumulative impacts).

Goose Creek, which flows through a more densely residential area near the eastern alternatives, was also highly impaired from failed septic tanks, development, and heavy metals from industry (again, not clear which ones). It also has wooded areas which support the endangered Indiana bat. The EIS did not know the extent of contamination now (existing condition), what future actions might contribute more contaminants, or what the potential impacts on particular resource(s) might be (cumulative impacts). This team wanted the definitions of: “infrequent violations,” “occasional violations,” and “frequent violations” in order to understand the extent of problems with contamination now.

Harrod’s Creek and its tributaries Wolf Pen Branch and Hunting Creek, had contradictory information regarding whether it was actually currently contaminated or not for aquatic life and swimming from unstated toxins. The upper reaches flow through farmland, and the lower reaches through heavily populated and growing residential areas. There was some information regarding phosphorus and nitrogen from fertilizers from lawns, a golf course and farmland, and fecal coliform from residential septic tanks and a faulty wastewater treatment plant, but again not enough information to understand how the proposed action and future development might incrementally contribute to the contamination, and what resource(s) might be cumulatively impacted (however, a listed trout was mentioned in another section). The EIS also mentioned flooding in 1997, apparently from increased residential development, but it was not clear which streams actually flooded and which communities contributed to the flooding by approving excess development, and what the problems might be from flooding.

In Indiana, Lacassange Creek has wooded streambanks and flows through residential developments and farmland. No data was available for this creek, so its condition was inferred from data from the watershed; however, surveys indicated the presence of invertebrate and vertebrate species that were pollution-tolerant. Not much more was available in order to attempt to develop a cause-and-effect relationship. However, this creek was directly adjacent to some of the eastern alternatives.

Lanzier Creek, also wooded, flows through sparsely developed residential areas and farmland. It is currently not impaired, but INAAP would devegetate 20,000 feet of streambank, and the area is planned for dense future development. It is also near several bridge alternatives. Insufficient information was available for developing a cause-and-effect relationship, nor understanding what resource(s) might be impacted by the proposed action or induced growth.

A concern was identified by this group regarding water contamination in Lacassange and Lanzier Creek adversely impacting prey for the endangered Indiana bat, indicating a potential interrelationship with another issue and the role that the interdisciplinary approach can play in determining all potentially impacted resources.

Even with all the information available from the Affected Environment and Environmental Consequences chapters, overall, the EIS contained information, although limited and inconsistent across the various creeks, that was never used to identify the sources of contamination and the potentially impacted resources for either the no action alternative or the various alternatives associated with the proposed action. In other words, no analysis was conducted, although there was a high potential for cumulative impacts on aquatic resources (including, apparently, a “listed” trout) and public health, including restrictions on swimming and eating fish, especially on the Kentucky side (the more highly developed side).

2. Impacts to Threatened and Endangered Species

Because of the relationship of several of the streams, especially Lancassange and Lanzier Creeks on the Indiana side and Goose Creek on the Kentucky side, I had the “endangered and threatened species” group present next. Although the EIS talked about “endangered and threatened species,” it focused on the Indiana bat and, to a lesser degree, the listed gray bat. There was much more information about the species themselves, but not much site-specific information about their habitat. The primary concerns involved degraded water quality, apparently in terms of the availability of insects near contaminated waters, and loss of roost and maternity trees from industrial development (INAAP, North Point, East, and Ridge Business Centers, and the Fort Knox Training Center) and, potentially, residential development. Again, no analysis of any of this information was conducted (despite the existence of other NEPA documents for the federal military facilities being converted to industrial sites) to determine cause-and-effect relationship in terms of existing habitat and prey base and what would happen with the proposed alternatives that would further destroy habitat along Goose, Lacassange, and Lanzier Creeks, in addition to what has already been destroyed and would be destroyed through industrial development.

3. Impacts to Wetlands

The team evaluating impacts to wetlands attempted to show the relationships among groundwater discharge/recharge, water quality and the contaminant filtering functions of some wetlands, wildlife and aquatic habitat in terms of threatened and endangered species and fragmentation, sediment filtering functions, and the relationship of wetlands to flood reduction function of associated floodplains in a generic way. The EIS identified that over 65 acres of wetlands might be destroyed, with over 4 acres from the preferred alternative, but had almost no information on specific wetlands, their actual locations and

functions, and their current and future conditions. The team said they needed additional information on: the types and functions of specific wetlands that might be impacted by the proposed action, the current conditions, how the various wetlands inter-related to perform certain functions in specific locations, their relative locations within the watershed(s), location of future activities and impact to wetlands, the temporal and spatial boundaries of cause-and-effect relationships, which wetlands were jurisdictional, and information on groundwater. They also wanted the number of acres that has been/would be impacted by development (past, present, and future) and those that would be impacted by each alternative in each stream-shed, as well as their specific functions.

Some data were available in tables, but it would have taken a substantial amount of time to actually conduct an analysis on this raw data, just in terms of site specific acres that would be destroyed, notwithstanding the requirement to conduct an actual impact analysis.

4. Impacts to Historic Structures/Districts

Interestingly, the EIS focused primarily on impacts to historic structures/districts, with detailed information on over 80 structures and districts (including detailed information on individual structures within districts) in over 100 pages in the EIS itself. I selected three structures and districts, each with different characteristics and types of potential impacts, for the team to evaluate.

The Schwartz Farm Rural Historic District is currently bordered on the west by several planned business centers and surrounded by existing and planned residential areas, already compromising its integrity. One of the proposed actions would bisect the property (although it would not directly take any structures) and would impact the integrity of the district by degrading the visual quality and substantially increase vibration and noise from traffic, as well as during construction. It would most likely be considered a “taking” under Section 4(f), although this was not disclosed in the EIS.

The Phoenix Hill Historic District, in downtown Louisville and a part of the original city, is already bisected by I-65 immediately south of the Kennedy Interchange, and is already experiencing noise and vibration, as well as degradation of the visual quality. Reconstruction of the Kennedy Interchange and its southerly accesses associated with I-65 would further fragment the area, which has some of the earliest remaining examples of historic residential areas in the inner city, as well as increase traffic and construction noise and vibration, and further degrade the viewshed. However, it was unclear if the incremental impact from the proposed action would create significant impacts over and above what has already been done under the no action alternative, nor was it stated if this would be a “taking” under 4(f).

The third structure is a concrete block fishing camp on the shores of the Ohio River (to survive river flooding) built in 1954, which is currently not impacted and is in pristine condition. Several of the easterly proposed elevated bridge crossings would place the camp directly in the shade of the bridge, increasing noise, increasing light at night from the artificial bridge lighting, and substantially detracting from the natural recreational experience for which the structure was built. The team felt that this would be a direct effect, although the effects of the shade, noise, and bridge lights added together could be cumulative. The EIS does not put this camp in the context of its importance and

uniqueness – are there other similar camps along the river? If so, have they been impacted in the past? Is this one of the few remaining camps in pristine condition and still used for its intended purpose? If so, the spatial boundaries of the cause-and-effect relationship would be broadened to include the other sites, and the no action alternative would already have cumulative impacts. The EIS never states if this would be a “taking” under 4(f).

Overall, despite the comparatively large amount of information available for each structure/district, even with the information added from the Environmental Consequences chapter, the team could not develop actual cause-and-effect relationships for any of them, nor could the team identify the degree of the actual impacts on each structure/district of the no action alternative and the incremental contribution of the proposed alternatives.

G. Conclusions

In general, even though substantial amounts of money was available for the cumulative impact technical report and the EIS, substantial public involvement was conducted, and each document was several inches thick, the effort failed to:

- provide the right kind of information/data for important resources
- collect consistent information for different resources within the same category (such as water quality for each stream)
- focus on or even identify the particular resource(s) impacted
- identify specific actions contributing to the impact on each resource
- identify the cause-and-effect relationships for each affected resource, including historic structures and districts, despite the large amount of information available for each one
- identify clearly the spatial and temporal boundaries of the cumulative effect analysis for each resource
- use the systematic interdisciplinary approach for conducting analysis
- Conduct any impact analysis at all for any of the resources discussed, including the no action alternative and the proposed alternatives as change from no action
- Conduct site specific analyses

In other words, the effort did not meet the purposes of NEPA, including the requirement for cumulative impact analyses.